



WILLAMETTE
SPECIAL INVESTMENT PARTNERSHIP
**ACCOMPLISHMENTS
SUMMARY REPORT**



Meyer Memorial Trust



Bonneville Power Administration



Oregon Watershed Enhancement Board



Oregon Watershed Enhancement Board
January 2016

WILLAMETTE SPECIAL INVESTMENT PARTNERSHIP ACCOMPLISHMENTS SUMMARY REPORT



In March 2008, the OWEB Board allocated funding for the Willamette Special Investment Partnership (WSIP) to reestablish channel complexity and length and reconnect floodplains in the historic meander corridor of the Willamette mainstem and select tributaries. This report provides an overview of the progress made by the WSIP toward achieving their three desired ecological outcomes from the program's inception in 2008 to 2015.

Background

Funding Partners

The WSIP has been a unique funding partnership involving a federal agency, Bonneville Power Administration (BPA); a state agency, Oregon Watershed Enhancement Board (OWEB); and a private foundation, Meyer Memorial Trust (MMT). OWEB launched the WSIP in 2008 and joined with MMT's Willamette River Initiative to co-fund projects on the mainstem and in select small tributaries. In 2010, BPA joined the partnership to help leverage its mitigation responsibilities for dams on the major tributaries to the Willamette. BPA funding supports in part, OWEB WSIP staff. It also supports mainstem restoration and acquisition, with the latter occurring mainly through the Oregon Department of Fish and Wildlife's (ODFW) Willamette Wildlife Mitigation Program (WWMP).

Program Area

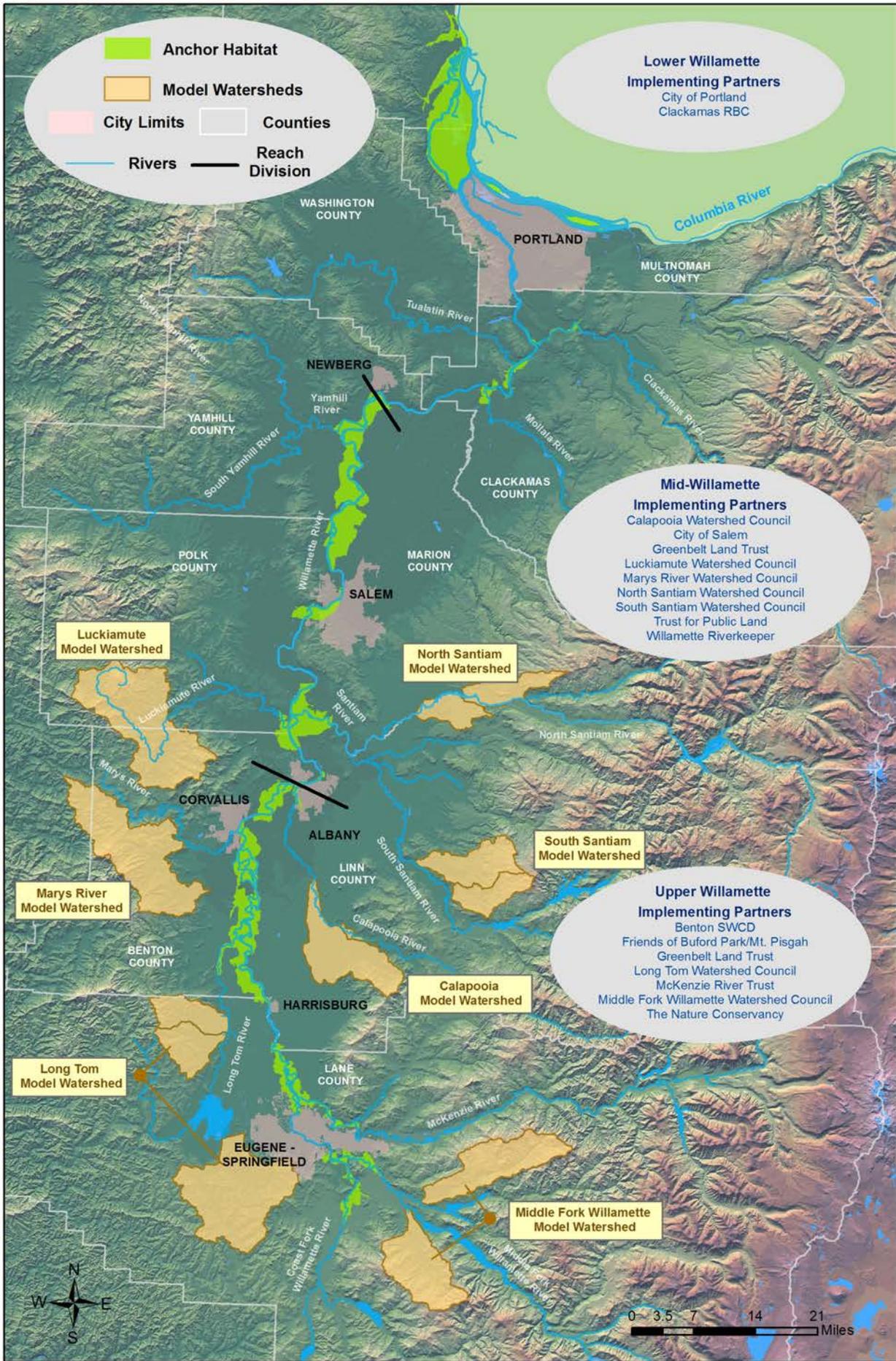
The WSIP encompasses the length of the Willamette River from its confluence with the Coast and Middle forks downstream to its confluence with the Columbia River, as well as select tributaries, referred to as Willamette Model Watersheds. On the mainstem, priority actions occurred in the 100-year floodplain and emphasize areas of significant public ownership or high restoration potential, intact native habitat, and cool water. These areas are the "Anchor Habitats" shown in bright green on the map on page 2. Tributary sites were selected based on their position in the basin landscape (all are below dams except one) and their ecological and social attributes, as defined by the local implementing partners.

Technical Partners

The Bonneville Environmental Foundation (BEF) works closely with the Model Watersheds to provide program management and technical support to the watershed councils and mainstem implementing partners. Cascade Pacific RC&D has provided important administrative grant support. River Design Group has provided engineering and design expertise. ODFW, Oregon State University, University of Oregon, and U.S. Geological Survey have all contributed to the mainstem's scientific framework.

Implementing Partners

Along the mainstem river, the funders partnered with approximately twenty groups. These groups have worked with public and private landowners to implement a range of projects. These implementing partners include several watershed councils and soil and water conservation districts; city and local governments; tribal, state and federal agencies; and non-government organizations, including land trusts. In the tributaries, the funders partnered with seven watershed councils to implement restoration along the selected streams in the Willamette Model Watersheds — Long Tom, Luckiamute, Marys, Middle Fork Willamette, Calapooia, North Santiam, and South Santiam.



Desired Ecological Outcomes

The funders and implementing partners established the following goals and desired ecological outcomes for the WSIP.

Willamette River Mainstem

The goal is to establish a network of key habitats, or “Anchor Habitats,” within the historic meander corridor of the Willamette River that supports the ecological processes and functions necessary to improve habitat conditions for native aquatic and riparian species. Over time, three desired ecological outcomes emerged to guide the implementing partners’ actions:

- 1) Protect floodplain habitats
- 2) Restore floodplain habitats and side channels
- 3) Restore floodplain forests

The adjacent process diagram, developed by the partners, illustrates the relationship between current understanding of how the Willamette River system functions, the three desired ecological outcomes that emerged from this understanding, and what actions have thus far been taken in support of those.

Model Watershed Tributary Streams

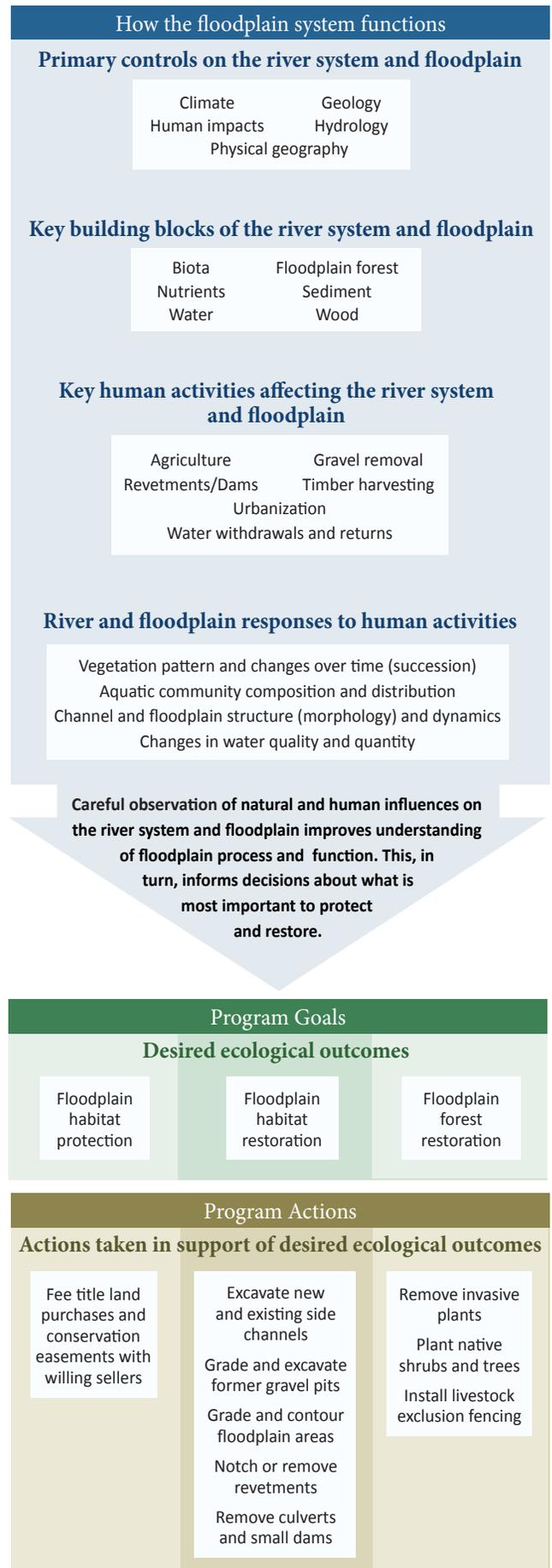
The goal is to demonstrate that sustained, long-term funding—matched with an integrated, community-based, whole watershed approach—can revitalize a watershed. Three desired ecological outcomes guided actions taken by the implementing partners:

- 1) Protect and restore riparian/aquatic corridors
- 2) *Enhance and restore habitat for native fish and wildlife
- 3) *Enhance flow and improve water quality

** Ecological outcomes with an asterisk (*) do not involve OWEB WSIP funding and are not discussed in this report.*



Middle Reach Calapooya River, Model Tributary multi-landowner restoration effort involving CREP floodplain revegetation and fencing.



Applying a Scientific Framework

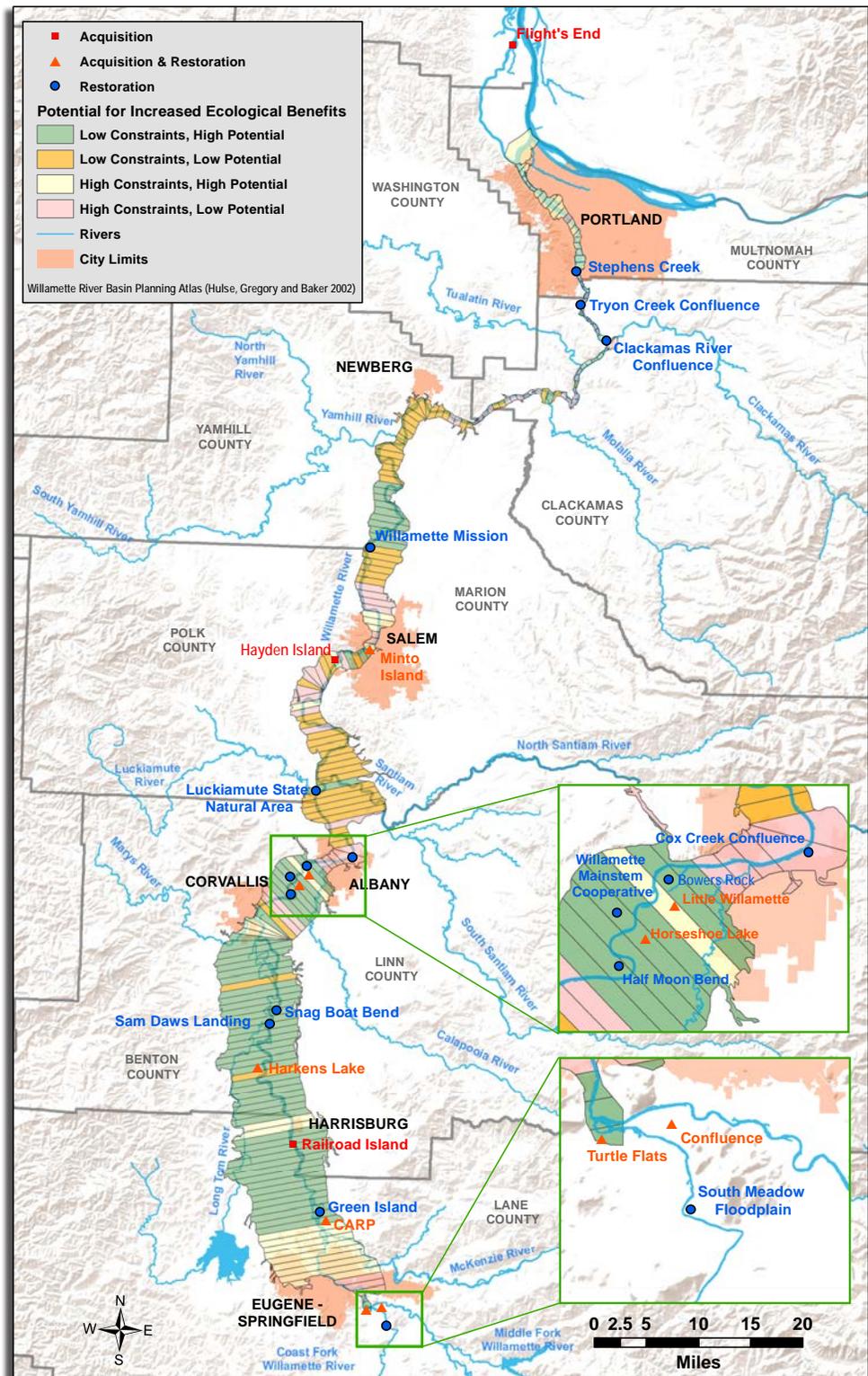
Underpinning restoration in the Willamette is a broad body of previous and ongoing research that provides a scientific framework and assists in the prioritization of restoration actions.

Willamette River Mainstem

WSIP implementing partners track their restoration progress through the use of GIS and specially designed databases. For example, the SLICES Framework — developed jointly by the University of Oregon and Oregon State University — is used by implementing partners for targeting priority actions and monitoring outcomes.

The framework helps implementing partners target conservation and restoration priorities by using numbered transects, or ‘slices,’ drawn at right angles to the mainstem’s floodplain axis. Each 1-km slice is color coded to show areas of potential for increases to ecological benefits combined with demographic and economic constraints. As shown in the adjacent map, the greatest ecological potential with the lowest demographic/economic constraints (green and orange slices) occurs in the Upper Willamette, which is where most WSIP activities have occurred.

The framework is also used by implementing partners to monitor long-term outcomes through status and trends analysis. For example, SLICES has modeled desired levels of mainstem floodplain forest and channel complexity to be achieved by the year 2050. This “2050 Conservation Scenario” includes 24,000 additional acres of floodplain forest, and 93-miles of additional river channel, compared to 2010 levels.



Model Watershed Tributary Streams

A common action identified for all the model watersheds was the need to restore riparian conditions. The implementing partners developed individual action plans that outline specific restoration activities, including riparian action targets, to be implemented over the decade (2009-2019). Riparian projects that best fit the SIP model are those that provide clear fish and wildlife benefits and offer a high potential for stewardship in conjunction with private landowners.

Measuring Progress: Floodplain Habitat Protection

Limiting Factors

A majority of the land in the Willamette River Floodplain is in private ownership. Activities from agriculture to urbanization have impacted the river's and streams' natural process and function with serious consequences for fish and wildlife habitat.

Objectives

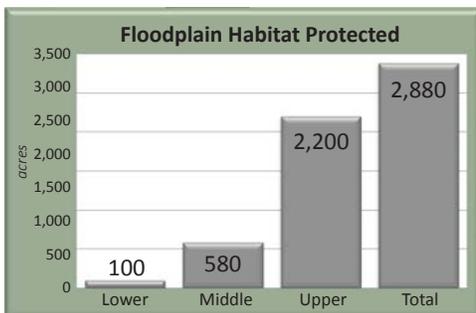
Acquire lands from willing sellers along the mainstem to provide a protected land base for complementing the existing network of conservation lands and restoring important fish and wildlife habitat in the Anchor Habitats.

Actions Taken

Purchasing of land (fee title and conservation easement) from willing sellers.

Outputs

Since 2008, 10 land acquisitions have occurred along the mainstem, permanently protecting a total of 2,880 acres of floodplain habitat. These acquisitions complement the existing public network of conservation lands (e.g., 8,685 acres of State Parks holdings) in the Anchor Habitats.



HIGHLIGHT: Coburg Aggregate Reclamation Project (CARP)



An aerial photo of the CARP acquisition

In 2010, the WWMP helped McKenzie River Trust (MRT) acquire the 56-acre CARP site for \$1.3 million. This acquisition, located at the confluence of Willamette and McKenzie rivers, is a critical addition to the Green Island complex (acquired prior to the WSIP in 2003). This former sand and gravel mining site encompasses three shallow gravel-pit ponds and secondary side channels. It offers important off-channel habitat for numerous species, including spring Chinook salmon, Oregon chub, Western pond turtle, and red-legged frog. With WSIP funding, MRT has undertaken extensive restoration activities, which will contribute toward the WSIP's desired ecological outcomes. **Recent monitoring that occurred after the restoration actions were completed document that cold-water refugia have been created in side-channels and are being used by juvenile Chinook during the hottest period of the summer.**

Measuring Progress: Floodplain Habitat Restoration

Limiting Factors

- Human interventions (urbanization, agriculture, flood control, transportation, etc.) over the past 200 years have resulted in a confined stream channel with reduced off-channel habitat and loss of essential wetlands with serious consequences for habitat for native species.
- Water quality throughout the basin suffers from high summer temperatures and low dissolved oxygen levels.
- The regulatory dams, as well as 96 miles of revetments at 260 locations along the mainstem, prevent the river from naturally meandering across the floodplain.

Objectives

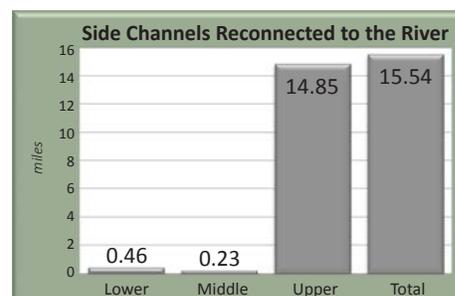
- Increase the area of floodplain that is inundated
- Increase side channel length, complexity and connectivity to the mainstem
- Create new, and enhance existing, side channels to provide off-channel fish habitat
- Control aquatic species occupying sloughs and side channels
- Prioritize restoration activities at known cold-water refugia

Actions Taken

- Excavating openings to existing floodplain side channels
- Excavating new and enhancing existing side-channels with large woody debris
- Removing or upgrading existing culverts and breaching levees
- Grading and excavating former gravel pits
- Grading and contouring existing floodplain areas

Outputs

The majority of floodplain habitat restoration work has occurred in the Upper Willamette (see graph). This is consistent with the SLICES Framework, which shows this reach of the mainstem to have the highest ecological potential and the lowest demographic/economic constraints (see map on page 4). Program-wide, implementing partners have connected over 15 miles of side channels to the river; increased channel complexity; and improved habitat for native fish by adding large woody debris and boulders to over nine stream miles, removing 17 barriers, and restoring six acres of wetlands.



HIGHLIGHT: Willamette Confluence

TNC's Willamette Confluence acquisition is a complex of former gravel pits at the confluence of the Coast and Middle forks of the Willamette River, south of Springfield. This site, with its more than six miles of river frontage, is one of the few remaining large pieces of mostly intact wildlife habitat in the Willamette Valley, supporting numerous fish and wildlife species, including listed spring Chinook salmon, Willamette winter steelhead and Oregon chub.

Restoration at this site began in 2014. Once all phases are completed, TNC will have reconnected the river at this site to its floodplain, treated 6 stream miles to improve habitat complexity, and created and enhanced 4.5 miles of secondary side channels that are accessible to fish.

Results from recent monitoring efforts show that the water temperature in the side channels has been reduced by 10-12° F, native fish species richness increased after the first side-channel reconnection to the river and the populations of red-legged frog and western pond turtle are healthy in the project area.



Contractors preparing to install a log jam for fish habitat at the Pudding Ponds site of Willamette Confluence

Measuring Progress: Floodplain and Riparian Forest Restoration

Limiting Factors

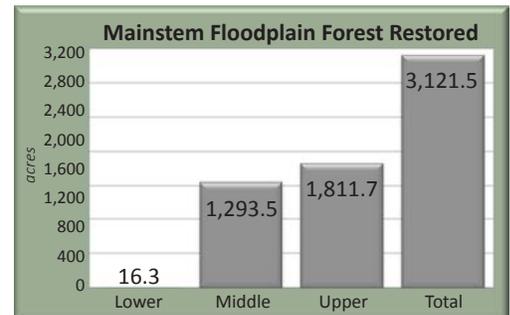
- Agriculture conversions, expanded urbanization, rural residential housing, invasive plants and gravel extraction operations have impacted native vegetation and the processes that allow revegetation to occur naturally.
- Modifications such as channel straightening and incision, limiting the stream's interaction with the floodplain and resulting in reduced stream complexity and degraded riparian areas.
- Regulated streamflows in tributaries to the Willamette River have reduced the amount and frequency of floodplain inundation, thus impacting the processes that allow floodplain and riparian forests to become established and maintain healthy conditions.

Objectives

- Reduce habitat fragmentation and increase riparian connectivity and floodplain forest patch size
- Improve habitat complexity and increase native plant biodiversity
- Benefit native fish, wildlife, and neotropical migrating birds
- Decrease stream temperatures through shading, thereby limiting the amount of solar radiation reaching the stream
- Contribute nutrients and large wood to river and stream network
- Increase landowner stewardship of stream/riparian corridors

Actions Taken

- Site preparation (removing invasive species through herbicide application, mowing and/or cutting)
- Site restoration (planting native shrubs and trees; seeding native grasses and forbs)
- Site plant establishment (3-5 years post restoration of follow-up care and maintenance)
- Livestock exclusion fencing installation



Aerial photo of forest revegetation work occurring at Willamette Mission State Park. Brown areas have been treated for control of invasive blackberry, scotch broom, clematis, and ivy.

Outputs

Mainstem River

The majority of floodplain forest restoration work has occurred in the Mid and Upper Willamette. Once all currently funded projects are completed the implementing partners will have restored just over 3,121 acres of floodplain forest.

HIGHLIGHT: Luckiamute State Natural Area (LSNA)

The Luckiamute Watershed Council and the Oregon Parks and Recreation Department have had early and lasting success in employing a “Rapid Riparian Revegetation” (R3) approach at LSNA. This approach relies on thorough site preparation followed by dense planting. The result is a mosaic of thriving native shrubs and trees that are able to out-compete any invasive plants that might try to re-establish. LWC and OPRD are currently stewarding 251 acres of actively re-vegetated acres through plant establishment activities.

An additional 285 acres are in active management for forest release and enhancement and open habitat enhancement and weed management. **Once completed, this work will have increased the floodplain forest by 11% of the 29% called for in the SLICES 2050 Conservation Scenario, and will have enhanced 6% of existing floodplain forest in these slices.**



Planting crews at LSNA

Model Watershed Tributary Streams

To date, implementing partners in the seven model watersheds have contacted more than 1,135 landowners. This has resulted in the restoration of 978 acres of riparian corridors along 71 miles of stream. The partners have installed over 24 miles of riparian fencing and treated 60 stream miles of knotweed and other high-target invasive plant species. These efforts put the model watersheds more than three-quarters of the way toward their 2009-2019 action plan targets.

HIGHLIGHT: Calapooia-Santiam Model Watershed



Restoration crew working in the rain to remove blackberry along the Calapooia mainstem

OWEB WSIP funds have supported extensive riparian revegetation and targeted invasive species management in the Calapooia and North and South Santiam model watersheds. The three model watersheds collaborated to share the cost of a project and landowner outreach coordinator who secured the participation of landowners to implement 349 acres of riparian forest restoration and 8.6 miles of fencing at 48 sites. Professional planting crews have been critical to the program’s success at installing more than 715,000 bare root plants. **Initial results from**

effectiveness monitoring indicate that the sites that have been treated and maintained are on the right trajectory to meet restoration objectives. These sites show a reduction in invasive plant cover and an increasingly dense native tree and shrub cover compared to non-treated sites.



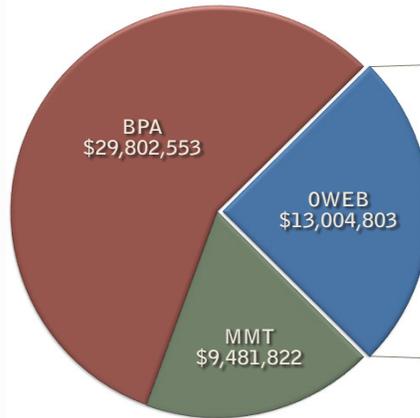
Restoration crews auger willow stakes into an eroding bank on Hamilton Creek

Summary of Contributions

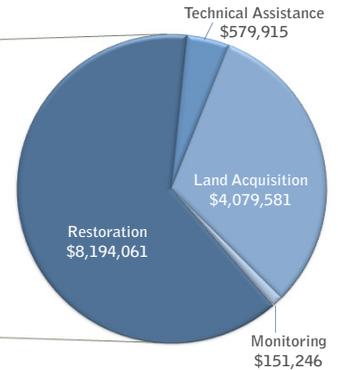
Key Points Regarding OWEB's WSIP Investment

- OWEB's investment of more than \$13 million includes \$9.2 million to the mainstem river and \$3.7 million to the tributary streams; MMT's investment of \$9.4 million includes \$5.3 million to the mainstem river and \$4.1 million to the tributary streams.
- Approximately one-third of OWEB's funds have gone to acquisitions and assisted in conserving important properties, including Harkens Lake (Greenbelt Land Trust) and Willamette Confluence (TNC).
- At \$23.3 million, the 2010 acquisition of Willamette Confluence accounts for nearly half the total WSIP investment for 2008-2015 (BPA paid \$20.8 million and OWEB contributed the remaining \$2.5 million).
- With the advent of BPA's WWMP in 2010, that partner became the primary funder of acquisitions in the Willamette Basin.

Total WSIP Investment by Funder



Breakdown of OWEB's Investment in WSIP



Local Economy and Community Outcomes

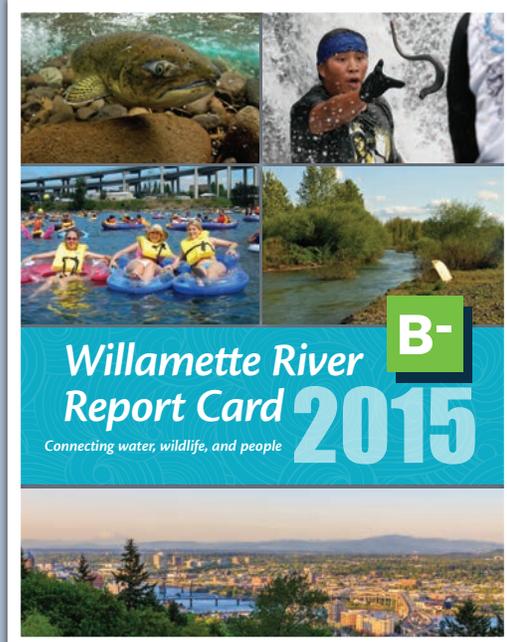
Supporting a "restoration economy," raising public awareness, building capacity of local implementing organizations, and fostering collaborative partnerships have all been hallmarks of the WSIP. While all three funding partners contributed to strengthening local economies through their restoration investments, MMT played an early lead role in ensuring community outcomes. From its early efforts to build the capacity of implementing partners to its three, Willamette-wide biennial conferences (*Within Our Reach*), MMT cast a wide net for advancing community outcomes. By mid-2015, two-thirds of MMT's overall grant-making, or more than \$6.5 million, were used for such purposes.

Local Economy



Labor-intensive actions, such as invasive species removal and revegetation throughout the WSIP, support a diverse workforce of several hundred people.

Community Outcomes



Community outcomes include the recently released Willamette Report Card — a multi-organizational, science-based effort to inform the general public of the mainstem river's overall health.

HIGHLIGHT: Landowner Stewardship and Engagement



Ludwigia before treatment

Benton SWCD's Willamette Mainstem Cooperative (WMC) brings together public and private landowners, private organizations, and citizen volunteers to improve stewardship across all landownerships along the mainstem river from Corvallis to Albany — a distance of 17 river miles. A 2012 survey designated more than 1,419 acres as high priority for restoration, with ivy and water primrose (*Ludwigia*) as the species of greatest concern. Currently, more than 1,000 acres are under contract for the purpose of controlling these high-priority invasives. The WMC has also recruited more than 50 volunteers to paddle the reach and pull water primrose from choked sided channels.



Volunteers pulling Ludwigia

Reflections

Lessons Learned: Funders' Perspective

Perhaps the greatest lesson learned by the funders early in the WSIP process was the need for adequate capacity for the implementing partners. For the Mainstem Program, in particular, the learning curve was steep. Few implementing partners had focused their work on this complex system and there was not enough knowledge and experience — among either funders or implementers — to establish specific targets for restoration. Accordingly, in the first three years of the WSIP, efforts were focused on building the capacity of core implementers, filling information gaps, and working with willing sellers to protect key parcels of land.

Lessons Learned: Implementing Partners' Perspective

- Ongoing and consistent communication and outreach are integral to success.
- Partnerships and technical support help expand the scope, scale, and effectiveness of local work.
- A modest, consistently funded program keeps implementing partnerships functional and effective.
- Not all desired ecological outcomes are necessarily priorities in all reaches.
- Each project yields valuable lessons that can be shared to inform the program as a whole.

Implementing Partners' Recommendations for the OWEB Board

- Keep in mind that significant ecological improvement does not occur in the short term.
- Keep in mind that implementing partners have limited control over externalities such as landowner willingness.
- Monitoring should be conducted programmatically by qualified individuals using consistent and simple metrics at the site-scale and long-term status and trends monitoring over a larger scale.
- Support data management/sharing and progress tracking by investing in database development and maintenance.
- Implementing partners need opportunities to present periodically to the OWEB Board and other funding partners on program activities.

Looking Ahead

The implementing partners have accumulated and shared a range of lessons that have recently been put to use by the Willamette Mainstem Anchor Habitat Working Group in developing their Upper and Middle Willamette Strategic Action Plan. These implementing partners will continue to collaborate to further common desired ecological outcomes. MMT and BEF will continue to steward model watershed tributary stream activities through 2019, at which point the program will sunset.



Special thanks for developing this report go to Ken Fetcho, Effectiveness Monitoring Coordinator; Wendy Hudson, Willamette SIP Coordinator (retired); and Troy Wirth, GIS and Technology Specialist. In addition, OWEB staff is grateful for the contributions of photos and reflections from some of the program’s review team members and many of its implementing partners.

We also thank our funding partners without whom this program could not have succeeded to the extent it has: Meyer Memorial Trust (Pam Wiley, Allison Hensey, and Cristina Watson); Bonneville Environmental Foundation (Todd Reeve, Kendra Smith, and Jean-Paul Zagarola); Bonneville Power Administration, Habitat Technical Team (Dorie Welch and Steve Gagnon); Willamette Wildlife Mitigation Program, Oregon Department of Fish and Wildlife (Bernadette Graham-Hudson and Laura Tesler); and the Northwest Power and Conservation Council (Karl Weist).

Photo credits: River Design Group, The Nature Conservancy, Luckiamute Watershed Council, South Santiam Model Watershed, Calapooia Model Watershed, Greenbelt Land Trust, Willamette Riverkeeper, Meyer Memorial Trust, and Benton SWCD.

For more information on the Willamette Special Investment Partnership, contact Eric Williams, Grant Program Manager, at (503) 986-0047, eric.williams@state.or.us.

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